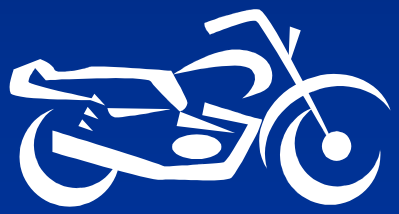
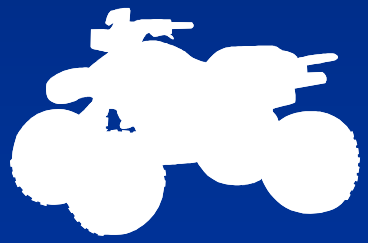
On-Road Motorcycle and Off-Highway Recreational Vehicle Draft Regulation Proposal





April 20, 2010

Outline

- Proposed Evaporative Emissions Performance Standards
- Proposed ORVR Standard
- Proposed Emissions Credits for Low Emitting Vehicles
- Proposed Design Certification for Small Volume Sand Car Manufacturers
- Proposed Test Procedures
- Test Results
- Fuels and Phase II Vapor Recovery Compatibility
- Minor Changes to Regulatory Sections
- Major Comments from MIC and ARB Responses
- Minor Comments from MIC
- Questions and Contact Information

Proposed Evaporative Emissions Performance Standards

- Standard is based on test results generated at ARB using low permeation fuel system components, a carbon canister, and fuel injection
- Test results must be less than sum of: tip test + running loss test + hot soak test + diurnal test

Model Year	Vehicle & Model Year	Standard (grams/test sequence)
2014 through 2018	ALL Off-Highway Recreational Vehicles and On-Road Motorcycles	1.75
2019 and Subsequent	ALL Off-Highway Recreational Vehicles and On-Road Motorcycles	1.25

Proposed ORVR Standard

- ORVR standard of 0.25 grams per gallon of fuel dispensed
  - Federal SHED test procedure with the following modifications:
    1. Test temperature 29 +/-1 ℃
    2. Fuel temperature 19.4±0.8 °C
    3. Flow rate 4-9 gallons per minute

Proposed Emissions Credits for Low Emitting Vehicles

- Allow intra-manufacturer averaging for equipment certified substantially below the standard

Effective Date Model Year	Applicability	Requirement	Credits Earned (only to be used in same MY)
2014	All On-Road motorcycles and OHRVs (gas, electric, etc)	Diurnal Emissions must be ≤50% of the performance standard	75% of the difference between the standard that the equipment was certified to and the performance standard

Example: -Certify at 0.75g -Standard of 1.75g

1.75g - 0.75g = 1.0g 1.0g x 0.75 = 0.75g credit

Proposed Design Certification for Small Volume Sand Car Manufacturers

- Many sand car manufactures are “Mom and Pop” type businesses, therefore design certification will be an allowable option
- The design certification option could only be utilized by manufacturers who make very few sand cars
  - ARB is requesting input on where the limit should be

Design Requirements (using SORE certified components)				
Effective Date Model Year	Fuel Hose Permeation Grams/m²/day	Fuel Tank Permeation Grams/m²/day	Carbon Canister Working Capacity Grams/Liter	Fuel Injection
2014	5.0	1.5	1.0	Required

Proposed Test Procedures

- Preconditioning
  - Soak fuel system for 140 days or equivalent
  - Conduct vibration test and condition the carbon canister if applicable
  - Conduct slosh test for surface treated tanks
- Tip Test
  - Fill to 100% of nominal capacity
  - Gravimetrically measure emissions when tipping the equipment 30° each direction
- Running Loss Test
  - Drain and fill to 50% of nominal capacity
  - SHED test at 95℉ with radiant loading and 7 RVP E 10 test fuel
  - UDDS or modified steady state UDDS load profile
  - Proportional road speed fan

Proposed Test Procedures Cont.

- Hot Soak Test
  - No drain or fill
  - SHED test immediately following running loss test
  - 90 minute test at 95℉ without radiant loading
- Diurnal Test
  - No drain or fill
  - 3-day SHED test using California Summertime 65°-105°-65° F diurnal profile
- Emissions standard will be compared to the sum of the above four tests

Test Results – Control Technology

- Control technology tests conducted using E10 fuel and a California summertime diurnal profile of 65°-105°-65°F

	Fuel	Running Loss (g/23 min)	hot Soak (grams/1.5 hour)	Diurnal Emissions (g/day)	Sum of Tests (g)	Average
Controlled ATV Polaris Sportsman 500 ATV EFI	E10	0.19	0.35	1.36	1.89	
	E10	0.15	0.32	1.88	2.35	
	E10	0.14	0.30	1.69	2.13	2.13
Controlled Dirt Bike Gas Gas 450 dirt bike (EFI)	E10	0.07	0.04	0.80	0.92	
	E10	0.14	0.02	0.51	0.68	
	E10	0.11	0.05	0.95	1.11	0.90

Overall Average 1.52 grams/test series

Test Results – Uncontrolled vs. Controlled

- All Inventory tests conducted using E6 fuel and a 72°-96°-72°F diurnal profile

	Running Loss Corrected THC (g)	Hot Soak Corrected THC (g)	Diurnal Emissions Corrected THC (g)	Sum of tests (g)
Uncontrolled Polaris Sportsman 500 ATV	11.65	1.63	5.60	18.88
	11.51	2.23	5.64	19.39
Uncontrolled Honda 450X	9.80	6.71	20.26	36.78
	10.34	5.70	17.73	33.78
Controlled Polaris Sportsman 500 ATV EFI	0.18	0.36	1.24	1.78
	0.10	0.27	1.09	1.46
	0.13	0.38	1.22	1.72
Controlled Gas Gas 450 dirt bike (EFI)	0.11	0.55	0.76	1.42
	0.13	0.71	0.97	1.81
	0.15	0.67	0.88	1.69

Test Results - Inventory

- All inventory tests conducted using California Summertime fuel and a 72°-96°-72°F diurnal profile

Inventory Tests

	Running Loss THC (g)	Hot Soak THC (g)	Diurnal Emissions THC (g)	Sum of Tests (g)
Honda 250EX ATV (off-road)	3.37	3.55	15.24	22.16
2008 Kawasaki KLR650 (on-road)	0.28	0.29	2.57	3.14
2008 Kawasaki KLR650 (on-road)	0.40	0.52	3.51	4.43

Certification

- OHRVs and On-road motorcycles must certify with ARB
- ARB will make changes to the certification procedure as needed by the new standards
- The details of the certification procedure will be presented at a future workshop

Fuels and Phase II Vapor Recovery Compatibility

- Fuels Compatibility
  - OHRVs and On-road motorcycles made available in California must be compatible with commercially available pump fuel
- Phase II Vapor Recovery Compatibility
  - The fuel filler area and ORVR system must be compatible with Phase II vapor recovery

Minor Changes to Regulatory Sections

- Defects Warranty Requirements Section
- Evaporative Emission Control Warranty Statement Section
- New Equipment Compliance Testing Section
- Variances Section

- The above sections will have:
  - No expected changes to the On-Road Motorcycle language
  - Minor changes to the OHRV language to reflect On-Road Motorcycles

Major Comments from MIC and ARB Responses

- **Comment:** ORVR and/or Phase II vapor recovery compatibility is technically difficult, expensive, and possibly unsafe

- **Response:** ARB is open to other solutions that will control a similar amount of emissions

Major Comments from MIC and ARB Responses Cont.

- **Comment:** The running loss test procedure is expensive for manufacturers

- **Response:** ARB is willing to consider alternative test procedures that can verify running loss reductions

Major Comments from MIC and ARB Responses Cont.

- **Comment:** Lead time may be inadequate for manufacturers to make changes and install expensive test equipment

- **Response:** ARB requests that manufacturers provide detailed lead time estimates

Major Comments from MIC and ARB Responses Cont.

- **Comment:** The automotive test temperature (65 °-105 °-65 ℉) may not be appropriate for motorcycles

- **Response:** The California summertime profile represents temperatures on episodic days

Minor Comments from MIC

- ARB should have fuel compatibility limitations
- ARB should be careful when using survey data
- ARB should make all test data available
- ARB should consider anti-tampering requirements

Minor Comments from MIC Cont.

- ARB should consider a percent control test procedure for diurnal emissions
- ARB should consider the economic conditions when implementing this rule
- ARB should host an inventory meeting

Questions?

- Please state your name and affiliation when commenting
- When possible, please provide written comments in addition to verbal comments

Contacts

For Questions Concerning Evaporative Emissions

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For Questions Concerning On-Road Motorcycle Inventory

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For Questions Concerning OHRV Emissions Inventory

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